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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,193	05/23/2006	Klaus Hilmer	290924US0PCT	1804
22850	7590	07/31/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BAUMSTEIN, KYLE				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
07/31/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/580,193

**Applicant(s)**

HILMER ET AL.

**Examiner**

KYLE BAUMSTEIN

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 7-9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al. (PCT/FR02/03646).

US PGPub. 2004/0236035 is used as an English language equivalent of the French PCT document.

Lagneaux teaches a thermoplastic polyurethane that is mixed with diisocyanate trimers or blocked isocyanates, which function as crosslinkers. The reference states that the crosslinker represents approximately 0.5 to 20 wt.% of the grafted polyurethane (¶ 0020). Said crosslinker is added to the polyurethane after it has been melted in an extruder, yield, upon extrusion, polyisocyanate functionalized polyurethane granules. The suitable isocyanates include trimers, isocyanurates, of diisocyanate or a blocked isocyanate. The preferred isocyanate is a trimer of isophorone diisocyanate (¶ 0021), but trimers of hexamethylene diisocyanate and polymeric MDI are included as acceptable crosslinkers (¶ 0018). While the invention does not generically include the use of mixtures of the acceptable isocyanates, example 3 is a polyurethane polymer being mixed with diphenylmethane diisocyanate (MDI) as well as isophorone

diisocyanate trimer (¶ 0056-¶ 0068). It has been held that the combination of two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition that is to be used for the very same purpose is *prima facie* obvious (*In re Kerkhoven*, 205 USPQ 1069 (CCPA 1980)). Therefore, it would have been obvious to one having ordinary skill in the art to have prepared a composition using both IPDI isocyanurate trimer and MDI diisocyanate based on the disclosure of the reference. Furthermore, although the prior art does not disclose the amount of each isocyanate, the presence of only two such components would lead one to immediately envisage using a 1:1 ratio of the two.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al. (PCT/FR02/03646) as applied to claims 1, 2, 4, 7-9, and 12 above, and further in view of Sapper (US PGPub. 2003/0032179).

Lagneaux teaches a polyurethane polymer that is cured by the addition of isocyanate(s). The isocyanate used in all three examples, Vestanat T1890, is an isocyanurate trimer of isophorone diisocyanate. The prior art also states that hexamethylene diisocyanate can be used as the isocyanate. However, the specific properties of the suitable HDI are not given.

Sapper teaches a polymer composition comprising a polyurethane that is cured in the melt with a mixture of isocyanate-containing compound. More specifically, Sapper discloses the preferred use of hexamethylene diisocyanate-based cross-linking agents (hereinafter HDI). The prior art teaches the use of blocked HDI-based

compounds including polyisocyanates containing isocyanurates based on HDI (page 2, line 36-42). Preference is given to polyisocyanates containing 2.5 to 5 isocyanate groups and viscosities from 100-5000 mPas.

Due to the similarities of the polymers being cured by the isocyanate-containing components, it would have been obvious to one having ordinary skill in the art to have used a hexamethylene diisocyanate isocyanurate as is disclosed in Sapper as the hexamethylene diisocyanate generically taught in Lagneaux as the cross-linking agent. In order to create an extrudable polyurethane resin, the amount of cross-linking must be within a range so as not to produce either of the extremes: a compound too viscous that would drip from the extruder or a compound too thick that extrusion is not possible. Furthermore, due to the large range of both NCO content and viscosity presented in Sapper, it would have been obvious to optimize such properties in order to obtain a compound having the desired amount of crosslinking and strength while still maintaining the flexibility required for most coating compositions.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al. (PCT/FR02/03646) as applied to claims 1, 2, 4, 7-9, and 12 above, and further in view of Porter et al. (US Pat. 5106874).

Lagneaux teaches a composition comprising a polyurethane resin and isocyanate crosslinkers. The prior art states that polymeric MDI may be used as an acceptable crosslinker. However, the reference is silent with respect to the properties of such a prepolymer.

Porter teaches a process for preparing a polyurethane elastomer by reacting a polyisocyanate and a polyether polymer. The polyether polymer used is specified as poly(propylene oxide) with an equivalent weight of about 1000 to 5000 (col. 4, line 10). The equivalent weight calculated in the patented invention is the molecular weight divided by the nominal number of isocyanate-reactive groups per molecule. Thus, a poly(propylene oxide) having the preferred functionality of about 2 would have a molecular weight of about 2000 to 10000. Such a polymer would be analogous to the instant application's claimed polyetherdiol. Porter goes on to teach the highly preferred use of a chain extender in the preparation of the elastomers, having a molar mass of about 60 to 600. More specifically, the invention comprises the use of alkylene glycols ranging from ethylene glycol to 1,6-hexamethylene glycol (col. 9, lines 13-22). Also, the prior art teaches the use of MDI as the especially preferred isocyanate to prepare the claimed polyurethane (col. 7, line 15).

Due to the nature of the polymer claimed in Porter, as well as the preferred embodiment of the use of polymeric MDI taught by Lagneaux, it would have been obvious to one having ordinary skill in the art to have used said isocyanate prepolymer taught by Porter as that which is claimed generically in Lagneaux. Regarding claim 6, even though Porter does not mention the viscosity or NCO content of the prepolymer prepared, it is assumed that using the same components as those disclosed as preferred components in the instant application will result in a prepolymer having similar viscosity and NCO content as that claimed in the instant application.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al. (PCT/FR02/03646) as applied to claims 1, 2, 4, 7-9, and 12 above.

Lagneaux teaches a polyurethane composition comprising a thermoplastic polyurethane and isocyanate compositions as crosslinking additives. The composition is synthesized and subsequently processed in an extruder. However, the prior art does not mention the additional use of feeding aids. The examiner takes official notice that it would have been obvious to one having ordinary skill in the art to have used a feeding aid to assist in introducing the components of the composition taught by Lagneaux to the extruder used to process the invented composition.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lagneaux et al. (PCT/FR02/03646) as applied to claims 1, 2, 4, 7-9, and 12 above, and further in view of Enlow, et. al. (US Pat. 6254712).

Lagneaux teaches a polyurethane polymer cured by the addition of mixtures of isocyanates. The prior art also discloses the process of adding the components to an extruder, yet fails to teach the use of an extruder equipped with a barrier screw.

Enlow teaches the use of an extruder equipped with a barrier screw to process thermoplastic resins. According to the prior art, the use of the barrier screw shows improvements over the use of extruders without said screw, including reduced feed surging, resulting in a more stable melt, and a more stable output (col. 38, line 58). Due to the improvement in the final product, it would have been obvious to one having

ordinary skill in the art to have used an extruder equipped with a barrier screw as is taught in Enlow as the generically claimed extruder taught in Lagneau.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KYLE BAUMSTEIN whose telephone number is (571)270-5467. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KBB/

/Randy Gulakowski/  
Supervisory Patent Examiner, Art Unit 1796